LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

The Electric Railway in Paris

I HAVE within the last few days received a letter from a friend in Paris, who writes that he had last week travelled on the electric railway in that city. There is still much, he adds, to be done before it can be brought into general use; but nevertheless the train moved satisfactorily. There were fifty-four passengers in the carriage, which was propelled by a large Gramme machine and 160 cells of Faure's battery. The experiments are to be recommenced very shortly with a new motor by M. de Méritens, and a Faure's battery. W. SPOTTISWOODE

41, Grosvenor Place, S.W., June 16

Probably New Variable and Red Star

ON May 22 I found, 2° 51′·7 north of α Cygni, a deep red or crimson star, which is not in the Bonn Catalogue. The nearest to it there is + 47° 3167, which in declination corresponds with a white star that I observed at the same time, but not in R.A.

Dr. Doberck writes to me as follows:—"Markree Observatory, 1881, May 29; observed the *new* star; brick-red, the nicest I ever saw, 8·7 mag."; and "1881, May 31: 1h. a.m., colour same as before; 8·4 m."

Mr. Ward of Belfast, who observed in the early morning of May 31 in strong twilight, describes the star as "deep crimson; beautiful object; two or three comites."

Mr. Gledhill, in Mr. Crossley's observatory, Halifax, found it, on May 30, "strikingly red."

Dr. Ball, the Astronomer-Royal for Ireland, observing at Dunsink, saw it "a superb crimson."

Prof. Krueger, director of the Kiel Observatory, described it as "*auffallend roth*" (remarkably red), on May 30.

On June 2 it appeared to me unchanged in colour, and increased from 9 mag. to 8·4.—June 7 and 8, colour still the same, and 8·3 or 8·4 magnitude.

Dr. H. Kreutz, writing from the Bonn Observatory, states that he finds an observation of the star recorded on June 19, 1857, but not at any other time during the progress of the observations for the Bonn Catalogue, in which it has not been published. There does not appear to be any note of its colour, and I think it will most likely prove a variable of a very remarkable character. Prof. Krueger makes its position for 1855 = α 20h. 36m. 37s.·9; δ 47° 37′ 33″. Herr Kreutz's position is α 20h. 36m. 37s.·0; δ 47° 37′·9. The white star mentioned above is not recorded in any of the Bonn observations; and, on the other hand, I may add that I do not identify + 47° 3167 in the telescope. I estimated the white star at about 9·5 mag. of Argeländer's scale, and therefore within the limits of the *Durchmusterung*.

The small stars seen by Mr. Ward are perhaps too distant to be strictly considered as comites to the red star. They are sufficiently difficult to me, though probably easy to his well-known extraordinary sight. The position of the nearest that I see is about 0°, and I find two others more distant—one at 350°, and one at 110°, with a power of 120° on a 4½ inch O.G.

There seems a peculiar dimness about the star, referable, probably, to the dark shade of its red. An uneducated person with a very excellent eye, and who never heard a description of a red star, compared it, at first view, to "a drop of *black* blood." It may be conveniently and well compared with Nos. 448 and 553 of my "Red Star Catalogue," especially with the former, the colour of which was described by Secchi as "intense"; and in the glowing red of the one object will be remarked a striking contrast with the deep sombre tint of the other.

I make the approximate positions of the red and the white stars for 1855, and corrected from my first observations, as follows:—

	h. m. s.	° ′
The red	20 36 27;	+ 47 37·5
The white...	20 36 18;	+ 47 46·8
Argeländer's position of his + 47° 3167	20 36 28;	+ 47 46·8

Millbrook, Tuam, June 3 JOHN BIRMINGHAM

The Doctrine of the Conservation of Electricity

I WISH to take the earliest opportunity of responding to the courteous letter of M. Lippmann, which appears in the current issue of NATURE, with the acknowledgment that his quotation from the *Comptes rendus* of 1876 establishes in the most conclusive manner his priority of date in the enunciation of the doctrine of the *Conservation of Electricity.* As to my own independent enunciation of this doctrine, it was arrived at without any knowledge of the comparison drawn by M. Lippmann in 1876 between the cyclical flow of heat (of Carnot's theorem) and the cyclical flow of electricity. I approached the matter upon somewhat different and less clearly defined lines, and finally struck upon the fundamental notion of the Conservation of Electricity when endeavouring to think out the relations between electromotive and ponderomotive force in an electric theory of radiation based upon Clerk-Maxwell's Electromagnetic Theory of Light. My speculations on this point were committed to writing some weeks ago, and will shortly be published. I content myself in the meantime with pointing out how near Clerk-Maxwell came to a similar conclusion. In Article 35 of his well-known treatise, he says emphatically: "While admitting electricity, as we have now done, to the rank of a physical quantity, we must not too hastily assume that it is, or is not, a substance, or that it is, or is not, a form of energy, or that it belongs to any known category of physical quantities. All that we have hitherto proved is that *it cannot be created or annihilated*" (the italics are mine). Nevertheless the immediate and logical conclusion that electricity, like matter and like energy, is subject to a law of conservation, appears to have been rejected by Clerk-Maxwell for reasons explained in Article 574 of his treatise, consequent on his inability to discover whether an electric current possessed momentum or could exert a mechanical reaction upon the matter of the conductor through which it flows. The unfortunate dilemma which suggested this experiment could hardly have been raised if it had then been as clearly understood as it now is that there is the same distinction between electrokinetic and ponderokinetic energy as between electromotive and ponderomotive force. But to discuss this matter further would lead me to take up too much space.

SILVANUS P. THOMPSON

University College, Bristol, June 19

Thought-Reading

IT would seem that the "discovery" of reading people's thoughts, lately mentioned in the daily papers, is in no way essentially different from the well-known "game" of "wishing" often played by young ladies. It consists of the following procedure. One person goes out of the room, while others arrange upon what she is to do. She enters blindfolded, and in the particular instance now alluded to, was turned round several times so as to be quite unconscious of the direction in which she was facing. Two persons now place their hands on either side of each shoulder, making their fingers meet at the back of the neck and under the chin; or they may be placed round the waist; but as the forehead appears to be equally sensitive, perhaps it is immaterial where the hands be situated. After standing still a moment or two, the lady moved slowly round in the direction of a sofa under the impression, as she afterwards said, that she was walking in quite another way. Having reached it, she sat down (not even knowing the sofa was close by), and deliberately put out her hand, took up an antimacassar which lay upon the sofa, and raised it, asking, "Is this what I was to do?" This was perfectly correct, the antimacassar having been expressly laid there for the purpose.

It was settled that another lady should walk into the conservatory. To do this she had to pull up a blind, lift an iron bar and open the shutters, then undo the glass door behind them which led into the conservatory. All this she did unhesitatingly, and walked straight into it. I could describe several other instances where ornaments and other things had to be selected out of various groups of objects, &c.: but the above will illustrate the process.

One essential condition of success is that the individual must voluntarily and entirely surrender the will, while those who hold the person blindfolded must *determine* as powerfully as they can that the latter shall do what they wish. Care should be taken not to *push* the individual in the desired direction. This however may be done involuntarily, but it will not account for the person doing all that has been previously determined after

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arriving at the spot. Some ladies describe a remarkable sensation accompanying the process: a sort of "all-overishness," or even faintness, so much so that the lady first alluded to on one occasion staggered, and could not proceed at all.

It appears to me to be a very peculiar psychological phenomenon well worthy of investigation, if possible, but too well known to be disputed. GEORGE HENSLOW

6, Titchfield Terrace, Regent's Park, N.W.

P.S.—Since writing the above I have heard of a much more remarkable case than the preceding. The operators sat in a circle, silent, but determinately "willing" that a certain lady should do what they had resolved upon. She stood in the centre, and was not blindfolded or touched by any one. In every case she did it correctly. One thing that was agreed upon was for her to take a bottle of wine from one table, carry it to another, and pour out a definite quantity of wine. This she did, not exceeding the amount predetermined. On a second occasion she had to find a key hidden away behind some books. As she approached the place she became very excited and hysterical, but at once extracted the key.

The above cases clearly show that as far as they are concerned "thought-reading" is an incorrect expression, as the person operated upon is a passive automaton, while others, as it were, force their wills upon her. "Will-imparting" would seem to be a better term.—G. H.

Notes of the Cuckoo

IN a letter appearing in NATURE, vol. xxii. p. 76, I stated that—"All the cuckoos here intone in a minor key except one, which alone does not flatten the 3rd of the tonic. The key is in all cases precisely D of concert pitch, as proved by a tuning-fork, and the first note is F on the fifth line." This year I find that, while the cuckoos here generally intone in D minor, as above, there is one again that intones in D major, and two others in C major and C minor respectively. Some that I casually heard in other places in the neighbourhood intoned in D minor.

Millbrook, Tuam, June 1 JOHN BIRMINGHAM

Notes on the Indian Glow-Fly

HAVING failed to find any critical description of these interesting insects, it is possible that the notes I am now able to send you may cause others to enter the field of inquiry. Situated some 2900 feet above the sea, and in Central Southern India amidst hills, valleys, and streams, I have had peculiar opportunities for observing them.

They are not to be seen during the daytime, but so soon as darkness steals upon twilight, so surely do these small natural lanterns become visible, and their numbers rapidly increase, much indeed as the visibility of the stars increases as the evening passes into midnight.

The fire-fly, when examined individually, is by no means a pretty-looking insect, and comparing it to other insects and flies, it is certainly both large and ungainly. An ordinary house fly is five-sixteenths of an inch in total length and weighs ·25 grains, but the subject of my notice has a total length of nine-sixteenths of an inch and weighs ·66 of a grain; we thus at once learn something as to his size and weight. The glow-fly—or beetle as I should term it—has a black head and antennæ; the thorax and abdomen are of a yellow-red colour. This latter part of the insect's body is divided into six rings, and, counting from the thorax, it is the fourth ring that emits the light. There is a rectangular opening in this ring which is merely covered by a very thin skin; it is in fact a *window* from which the light emerges. The insect has only one pair of wings: these are small, most delicate and thin, and are sheathed. It is worthy of careful notice that these insects fly both rapidly and slowly, but make no noise or buzz in the air. To test this further I have frequently liberated several of these glow-beetles in my bedroom, and in the dark they have only appeared as *fairy stars*, as no humming could be detected.

As regards the character and quantity of the light, I have to observe that one insect enables me to see the time by a white-faced watch when four inches distant; twelve of them placed in a glass jar enable me to read a book with ease, and are equal to a small Geissler's tube. The light is of an exceedingly beautiful colour—a sombre yellow tinged with green, but at intervals it is brilliant. A preliminary examination of the light in the spectroscope (a large one made for me by Browning) shows a distinct clear continuous spectrum, no lines or bands of any kind being visible.

The insect made to crawl on a card placed over the poles of a powerful compound permanent magnet showed no signs of uneasiness or change of light. Similarly placed over an electromagnet (ten Grove cells) and rapidly alternating the current caused no change. Placed within a coil of covered wire, no change. Blowing very gently, my breath on the insect caused no change; this was also tried with a blowpipe. Cold air at 50° caused a distinct diminution of the light; on the other hand, air at 100° caused an increase of light.

I now placed several of the insects in a bell-jar, and gave them a good supply of clean oxygen gas; the luminosity at once increased fully 25 per cent. On a dead insect (which still sheds light) oxygen gave similar results, and on extracting the luminous part and blowing oxygen upon it the light was much increased.

It will prove interesting to mention that, so soon as darkness has fairly set in, millions of these insects invade the trees, and as my bungalow is near to a stream and level with the tops of the trees, I am able to notice them with much care. The curious pulsation or flashing of their light is remarkable: the insects resting on the tree all act in perfect concert, *i.e.* five seconds of no light, then seven rapid flashes; five seconds, no light, seven flashes; and so the game continues throughout the dark hours.

At first I had reason to believe that the insect when flying only emitted light; this however is not the case; for when observing the Pole Star for variation with my theodolite, it occurred to me during a passing cloud to turn a telescope on to the glowing tree. At once I had the field of view filled with tiny stars, but both fixed and wandering.

It is also worthy of special notice that all the glow-insects on a dozen or more trees will continue to keep up the most perfect time as to the flashing of their light and the interval of pause, and this for many consecutive hours; but this singular agreement as to the time relates to close clusters of trees only. Thus distinct groups of trees separated by one or more hundred yards may not agree, and do not do so as a rule.

I have been informed on safe authority that the Indian bottle-bird protects his nest at night by sticking several of these glow-beetles around the entrance by means of clay; and only a few days back an intimate friend of my own was watching three rats on a roof rafter of his bungalow when a glow-fly lodged very close to them; the rats immediately scampered off.

In conclusion, these insects see by day as well as by night, and I incline to the idea that the beautiful light they carry serves as a means of intimidation or protection, and certainly as a means whereby to recognise friends.

As I gaze from my verandah down the Nadgani Valley into the dark night I see the pulsations of light here, there, and everywhere! and as my optical powers increase so do these gaseous, nebulous patches become resolved into real living stars! H. A. SEVERN

Wynaad, India, May 5

Birds Suffering from Cold

THE unusually severe weather (5° – 12° Réaumur) of these last twelve days struck heavily on the swallows of our country. They have been found dead by hundreds. The distress of the poor animals must have been extreme. Suffering from hunger and cold, they pressed against the windows, and being brought in suffered to be petted and fed, but died from exhaustion. In Kopidlno about 300 took shelter under a balcony, and the cold growing more and more intense towards night, they clustered on each other like bees until morning, when thirty were found dead. I have been walking this afternoon in the suburbs of Prague, where a fortnight ago I have seen swallows skipping on the river and hunting in gardens, but although the weather was now clear and warm, I could not see a single one. Tidings of suffering swallows come from the country, where people have been kind to them, feeding them on ants' eggs and flies, but they would not eat, and died. In some nests the young ones were found starved alone, in others their mothers were with them. J. V. SLÁDEK

Prague, June 16

An Optical Illusion

THE illusion of the inverted pin was shown me about the year 1846-47, and I well remember, when I was at Cambridge,

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